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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/577,166	05/24/2000	Richard L. Sutherland	SAIC0006-US	5232

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KILPATRICK STOCKTON LLP
607 14TH STREET, N.W.
SUITE 900
WASHINGTON, DC 20005

EXAMINER

ANGEBRANNDT, MARTIN J

ART UNIT

PAPER NUMBER

1756

DATE MAILED: 04/25/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/577,166

Applicant(s)

SUTHERLAND ET AL.

Examiner

Martin J Angebranndt

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2/19/03, 3/25/03, 3/6/03, 4/15/03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 47 and 48 is/are allowed.
- 6) ☒ Claim(s) 1-43 and 46 is/are rejected.
- 7) ☒ Claim(s) 44 and 45 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

1. This action replaces the action in the mailing of April 4, 2003 (paper 19). The office action of 11/19/2002 was mailed and returned to the office by the postal service. The applicant's representatives had noticed that an office action had been sent, but not received and a facsimile copy was sent to them. A response by the applicants was filed on 2/19/2003 after which the mail was returned. The office action of 11/19/2002 was re-mailed to the applicant on 04/04/2003, who contacted the examiner. Responses to the arguments offered by the applicant are presented after the first rejection to which they are directed. Rejections of the previous office action not appearing below are withdrawn. The examiner notes that all of the independent claims (claims 1, 12, 22, 32 and 46-48) all require electrically controllable holographic masters and form electrically controllable holograms. (some use on/off language)

2. The applicant filed an IDS on 2/25/2003, 3/6/2003 and 4/15/2003 and these total well over 100 references. Of these, numerous patents, such as US 5,220,928 and US 5,047,039, directed to inventions, which do not appear relevant to the instant claims, are cited. It is unclear why these patents were cited because they do not appear to be "material to patentability" of the claimed invention (37 CFR 1.56).

MPEP 2004, particularly paragraph (13), sets forth guidelines to aid applicants in their duty of disclosure. In this section it is stated "It is desirable to avoid submission of long lists of documents if it can be avoided. Eliminate clearly irrelevant or marginally pertinent cumulative information. If a long list is submitted, highlight those documents which have been specifically brought to the applicant's attention and/or are known to be of most significance. See Penn Yan Boats, Inc., v. Sea Lark Boats, Inc., 359 F. Supp. 948, 175 USPQ 260 (S.D. Fla. 1972), *aff'd*, 479 2d 1388, 178 USPQ 577 (5th Cir. 1973), *cert. denied* 414 U.S. 874 (1974)."

In an effort to clarify the "material" nature of these references to the patentability of the instant claims, applicants are requested to specify why each of the above referred to references were cited. (Note Applicants' PTOL-1449). Additionally, a number of the reference within the LC art seem merely cumulative to the prior art of record.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4 Claim 1-11, 22-31 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang '045, in view of Ikeda et al. EP 0087281 and Sutherland et al. WO98/04650, further in view of Margerum et al. '568.

Chang '045 discloses the formation of edge faded holograms, where the diffraction efficiency decreases from the center toward the periphery. This reduces the visibility of the edges of the hologram, thereby reducing the obstructions to visibility of the driver (1/28-30, 1/50-54 and 2/10-13). This method reduces the coherence of the laser light used in the two beam exposure process so that equal amounts of expose occur throughout the holographic recording medium, but the percentage of interferometric exposure is reduced at the edges (5/42-67, 7/59-67 and 8/5-19). The reduced coherence light fails to form interference patterns and yields an essentially incoherent exposure at the edges. (2/40-48).

Ikeda et al. EP 0087281 teaches with respect to figure 5 a master hologram, which is placed in close contact with a photosensitive layer and exposed to form a copy hologram. Figure

6 shows the formation of the diffracted beam and the passage of some of the transmitted beam, which acts as a reference beam. Figure 15-17 show scanning of the laser beam.

Sutherland et al. WO98/04650 teaches PDLC holographic recording media, which are used to record gratings. The use of two beam exposure processes with these materials is disclosed. (8/15-30 and 9/19-33). The compositions are disclosed as using a photopolymerizable monomer, a second phase material, a photoinitiator, a co-initiator, a chain extender (or crosslinker) and optionally a surfactant. Useful photopolymerizable materials including mixtures of di, tri, tetra and penta acrylates, such as triethylethylene glycol diacrylate, trimethylpropane triacrylate, pentaerythritol triacrylate, pentaerythritol tetracrylate, pentaerythritol pentacrylate and the like. (10/14-27) The use of dipentaerythritol hydroxypentacrylate is disclosed. (11/12). Useful second phase materials are described as LC materials and include E7 and cyanobiphenyls (10/28-11/26 and 19/1-22/16). Useful photoinitiators including rose Bengal esters, fluoresceins, cyanine dyes are disclosed. (11/36-12/16) Useful co-initiators including N-phenyl glycine are disclosed. (12/17-32) Useful crosslinker/chain extenders including vinyl monomers, such as N-vinyl pyrrolidone are disclosed. (12/33-13/8) Surfactants lower the operating voltage and useful surfactants include octanoic acid. (13/9-14/13). The recording media are placed between ITO coated slides as discussed on pages 15 and 11 and through application of voltage through these ITO electrodes are electrically switchable to control the birefringence and transmittance of the LC material within the cured polymeric matrix. Useful amounts of the various components are disclosed on page 17. The stacking of these containing multiple gratings is disclosed on page 28 with respect to figure 17. The disclosure of these for application where holographic images are desired to be

switchable is disclosed. (28/31-29/3). The formation of either reflection or transmission switchable holograms is disclosed (4/30-32).

Margerum et al. '568 teaches the use of a contact exposure through a grating mask to form diffraction gratings in PDLC recording materials. The use of a second exposure after the masked exposure is also disclosed with respect to figure 1. (5/5-57) The alternative use of a two beam holographic interference exposure is disclosed. (5/53-57, 2/27-31 and 2/54-59) The PDLC materials are coated between ITO coated glass films. (4/57-5/57). The recording of holographic patterns is emphasized. (11/33-41).

It would have been obvious to one skilled in the art to modify the process of forming edge faded holograms taught by Chang '045 by using contact copy methods such as those disclosed by Ikeda et al. EP 0087281 to obviate the need to a two beam exposure apparatus and to use the PDLC holograms of Sutherland et al. WO98/04650 as the master transmission hologram to obviate the need for diffusers of the like by coordinating the location of the laser beam used in the scanning copy process of Ikeda et al. EP 0087281 with the diffraction efficiency desired in that portion of the holographic copy. In the case Chang '045, interference pattern formation is prevented at the edges by rendering the percentage of exposure less coherent in these areas which is the same effect achieved by reducing the diffraction efficiency of the grating when exposure of the edge regions occurs as more of the light merely passes through the hologram when the diffraction efficiency is reduced and by further replacing the holographic recording material of Ikeda et al. EP 0087281 or Chang '045 with a PDLC holographic recording material to produce a switchable hologram with faded edges so that it could be turned off when it was not desired to be in the drivers view and processing without the need for wet development.

The applicant refers the examiner to the arguments of the appeal brief and their responses of 10/22/2001 and 11/5/2001. The examiner points out that this rejection was not of record at that time, rendering it unclear the specific points that the applicant might be referring to. The Chang reference was not even of record until the office action of November 15, 2002. (pages 14 and 15 of the response of 2/19/2003)

5 Claim 1-43 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang '045, in view of Ikeda et al. EP 0087281 and Sutherland et al. WO98/04650, further in view of Margerum et al. '568 and either Eguchi et al. JP 03-188479 or Wreede et al. '118.

Eguchi et al. JP 03-188479 teaches the contact copying of the reflection hologram where the incident beam (4) passes through the recording medium (32) and is diffracted to form beam (41) by the underlying reflection hologram (22).

Wreede et al. '118 teaches the contact copying of the reflection holograms (225 and 229) where the incident beam (RB2) passes through the recording medium (235) and is diffracted to form beam (DB2) by the underlying reflection hologram.

In addition to the basis provided above, the examiner holds that it would have been obvious to modify the process of Chang '045 combined with Ikeda et al. EP 0087281, Sutherland et al. WO98/04650 and Margerum et al. '568 use reflection PDLC holograms and the arrangement of either Eguchi et al. JP 03-188479 or Wreede et al. '118 to form reflective edge faded holograms.

The applicant refers the examiner to the arguments of the appeal brief and their responses of 10/22/2001 and 11/5/2001. The examiner points out that this rejection was not of record at that time, rendering it unclear the specific points that the applicant might be

referring to. The Chang reference was not even of record until the office action of November 15, 2002. (pages 15 and 16 of the response of 2/19/2003)

6 Claim 1-11,22-43 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sturdevant '946, in view of Redfield '861, Margerum et al. 218 and Sutherland et al. WO98/04650, further in view of Margerum et al. '568.

Sturdevant '946 teaches a continuous process where the holographic recording medium is preexposed without any pattern using UV light (21), Then the hologram is exposed using a laser and contact exposure through a holographic master (85) and then post exposed using a UV lamp. (91). The use of protective layers and a substrate is also disclosed with respect to figure 1.

Redfield '861 teaches that the precure to deplete the oxygen and reduce the induction period is disclosed. (10/5-11) If the holographic recording medium is not used soon after the precure, then it needs to be repeated but without causing polymerization as that would reduce the exposure range and hence possible diffraction efficiency of the hologram. (1/66-2/14 and 2/43-53) Similarly the fixation exposure can be carried out using the reference beam (12/1-20). The use of spatial light modulators is disclosed with respect to figure 1.

Margerum et al. '218 teaches the use of a precure to overcome the induction period in photopolymerizable materials. (2/33-39).

It would have been obvious to one skilled in the art to modify the process of Sturdevant '946 by keeping the protective and substrate layers and performing the pre-exposure at a longer wavelength using the laser to reduce the induction period of the polymerizable medium and use the laser to perform the fixation exposure based upon the teachings of Redfield '861 and Margerum et al. 218 and further to use the PDLC holograms of Sutherland et al. WO98/04650

with the grating pattern to be turned on during the holographic exposure and off during the pre-exposure and fixation exposure to reduce the time between the pre-exposure and the holographic exposure which is disclosed by Redfield '861 as critical and by replacing the holographic recording material of Sturdevant '946, Redfield '861 or Margerum et al. 218 with a PDLC holographic recording material to allow switchable holograms to be produced with all the exposures performed with the master and the holographic recording medium in contact and thereby gain the advantages of the reduced delay between the different exposure steps discussed above.

The applicant refers the examiner to the arguments of the appeal brief and their responses of 10/22/2001 and 11/5/2001. The examiner points out that this rejection was not of record at that time, rendering it unclear the specific points that the applicant might be referring to. The Margerum et al. '218 reference was not even of record until the office action of November 15, 2002. (pages 16 and 17 of the response of 2/19/2003)

7 Claim 1-43 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sturdevant '946, in view of Redfield '861, Margerum et al. 218 and Sutherland et al. WO98/04650, further in view of Margerum et al. '568 and either Eguchi et al. JP 03-188479 or Wreede et al. '118.

In addition to the basis provided above, the examiner holds that it would have been obvious to modify the process of Sturdevant '946 combined with Redfield '861, Margerum et al. 218, Sutherland et al. WO98/04650 and Margerum et al. '568 use reflection PDLC holograms and the arrangement of either Eguchi et al. JP 03-188479 or Wreede et al. '118 to form PDLC holographic copies of reflective PDLC holograms.

The applicant refers the examiner to the arguments of the appeal brief and their responses of 10/22/2001 and 11/5/2001. The examiner points out that this rejection was not of record at that time, rendering it unclear the specific points that the applicant might be referring to. The Margerum et al. '218 reference was not even of record until the office action of November 15, 2002. (page 17 of the response of 2/19/2003)

8 Claims 47 and 48 are allowable over the prior art. Claims 44 and 45 are allowable over the prior art, but objected to as being dependent upon rejected claims.

9 **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannndt whose telephone number is 703-308-4397. The examiner can normally be reached on Mondays-Thursday and alternative Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the

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organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

A handwritten signature in black ink, appearing to read 'M. J. Angebranndt', is positioned above the printed name.

Martin J Angebranndt
Primary Examiner
Art Unit 1756

April 22, 2003